

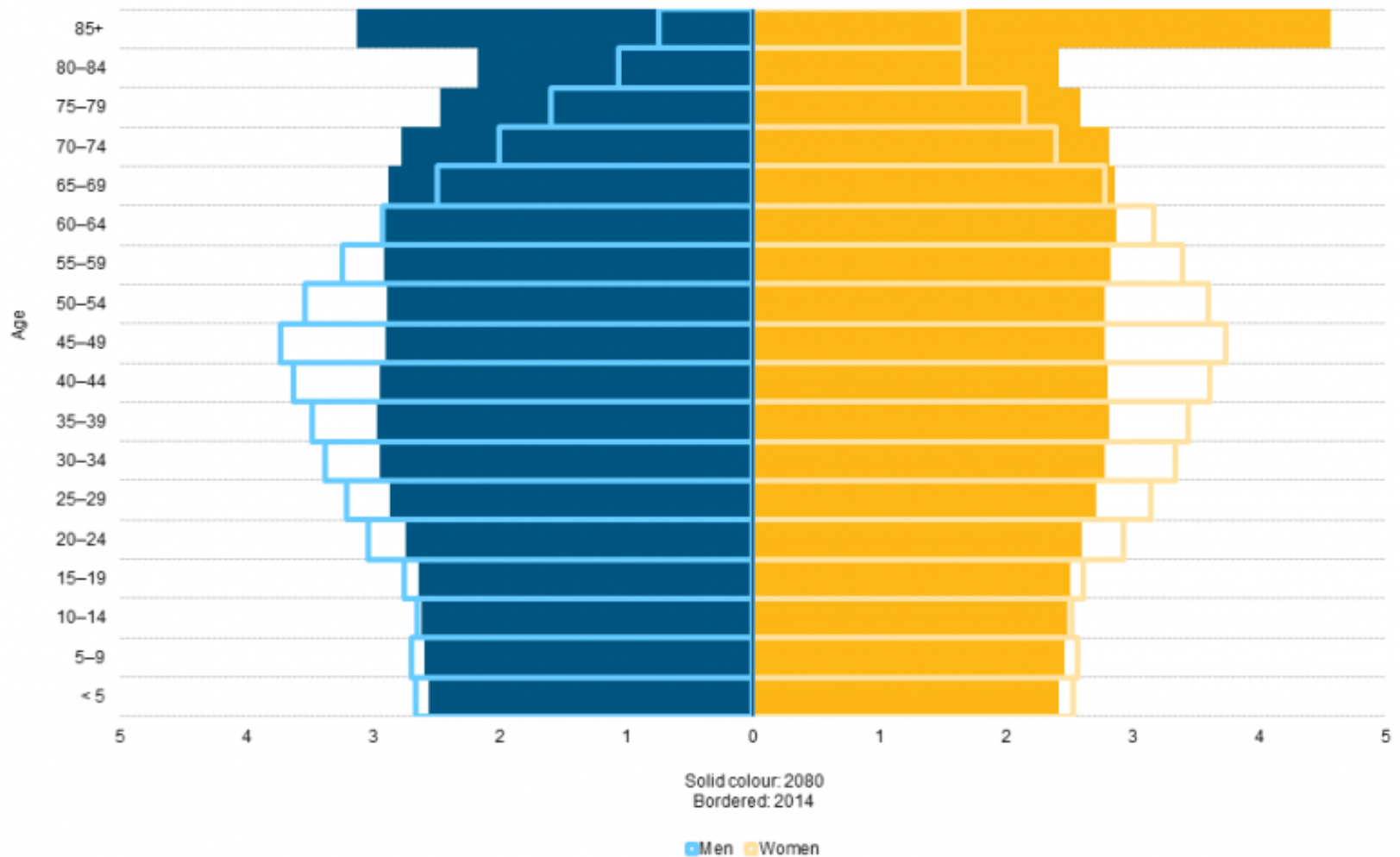
Nutrition in the twenty-first century

Tom Sanders DSc, PhD,
*Emeritus Professor of Nutrition & Dietetics,
Diabetes & Nutritional Sciences Research Division,
King's College London, UK*

Europe in the 21st Century

- People are living longer mainly due to declines in CVD and communicable diseases but an ageing population brings new challenges
- Obesity is increasing particularly in the young and may obliterate recent gains in life-expectancy
- Climate change – a need to reduce greenhouse gas emissions

Age structure of the European Population 2080 (filled) vs. 2014 (bordered)



(*) 2080: projections (EUROPOP2013).

Source: Eurostat (online data codes: demo_pjangroup and proj_13npms)

The Seventh Age of Man

“sans teeth, sans eyes, sans taste, sans everything.”

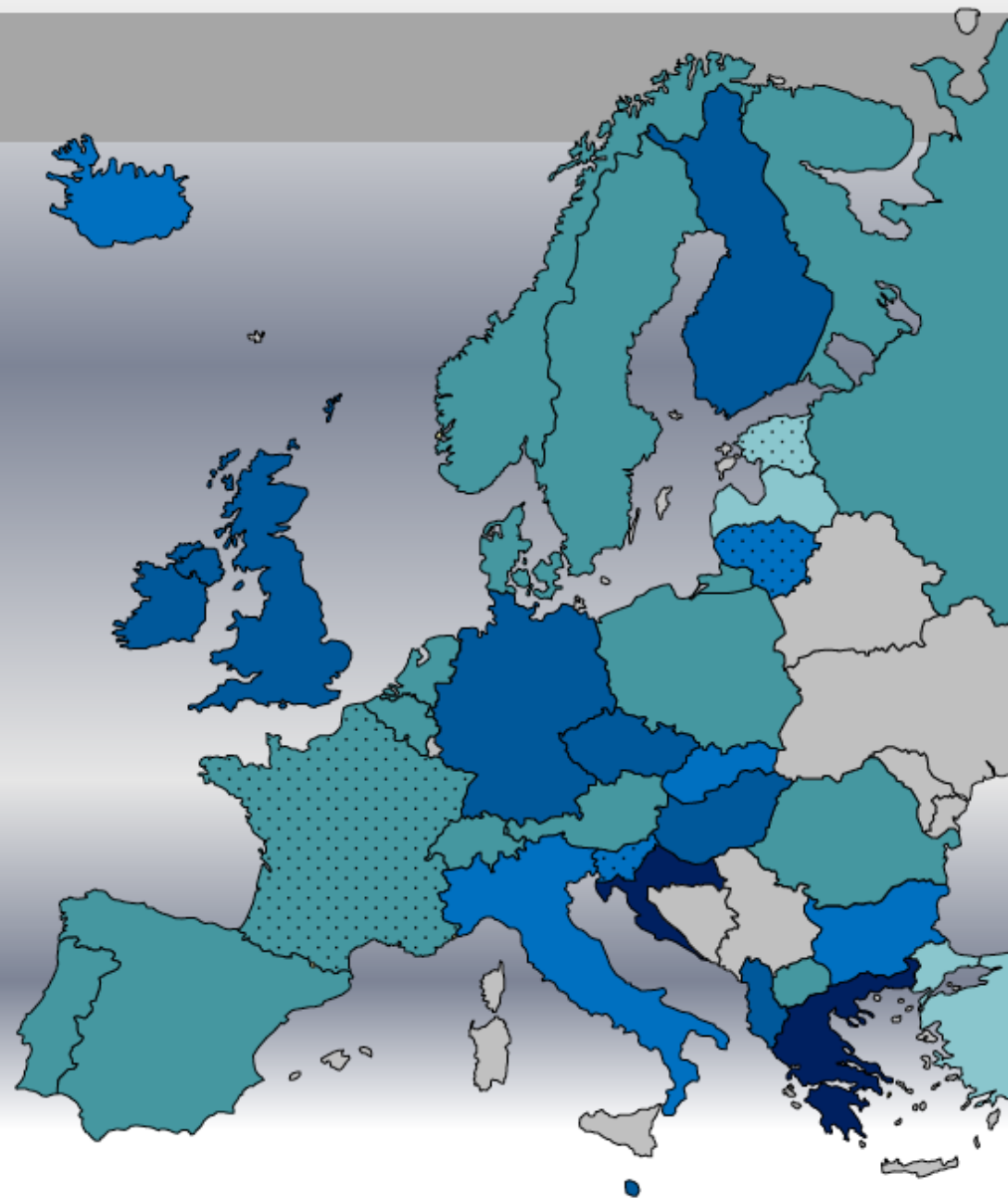
- Poor dentition
- Visual loss
- Loss of taste
- Dementia
- Loss of mobility and dexterity

Problems for older people

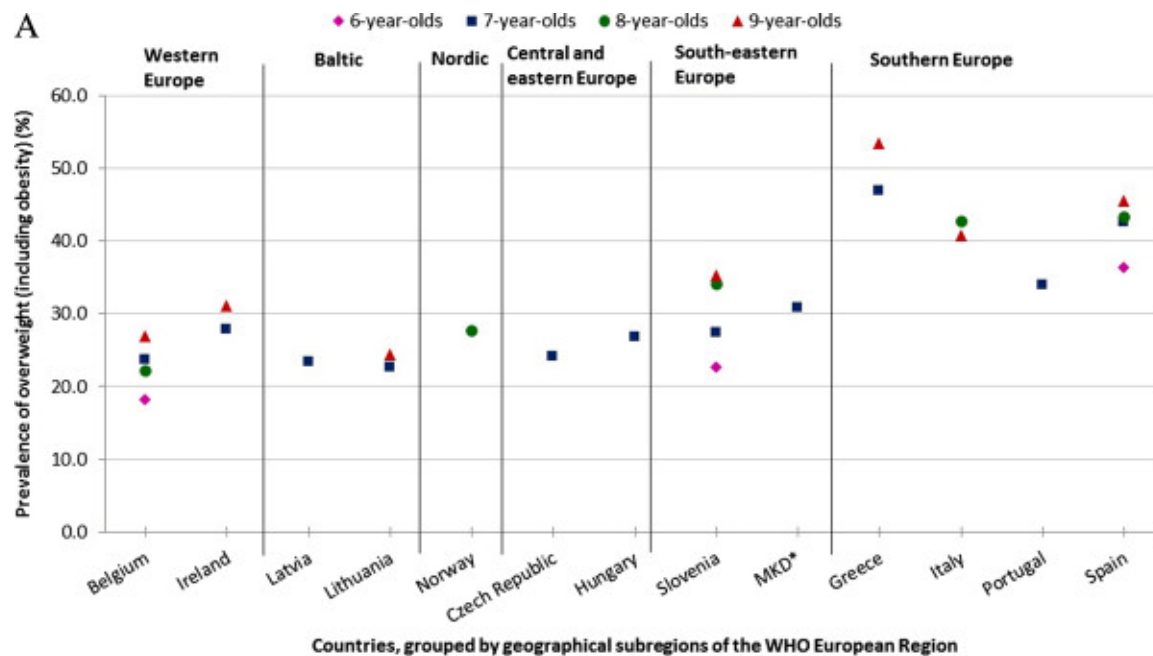
- Living alone
- No food skills for food preparation (especially men)
- Arthritis or disability makes opening tins, food packaging difficult
- Cannot read food labels because font size is too small
- Dentition – may find fruit, nuts and vegetables difficult to eat
- Housebound – no exposure to sunlight (vitamin D supplementation)
- Medication – may interact with diet
- Continence/prostate problems – may result in self restriction of fluid intake

Prevalence of Obesity in European Adult Males 2000-2005

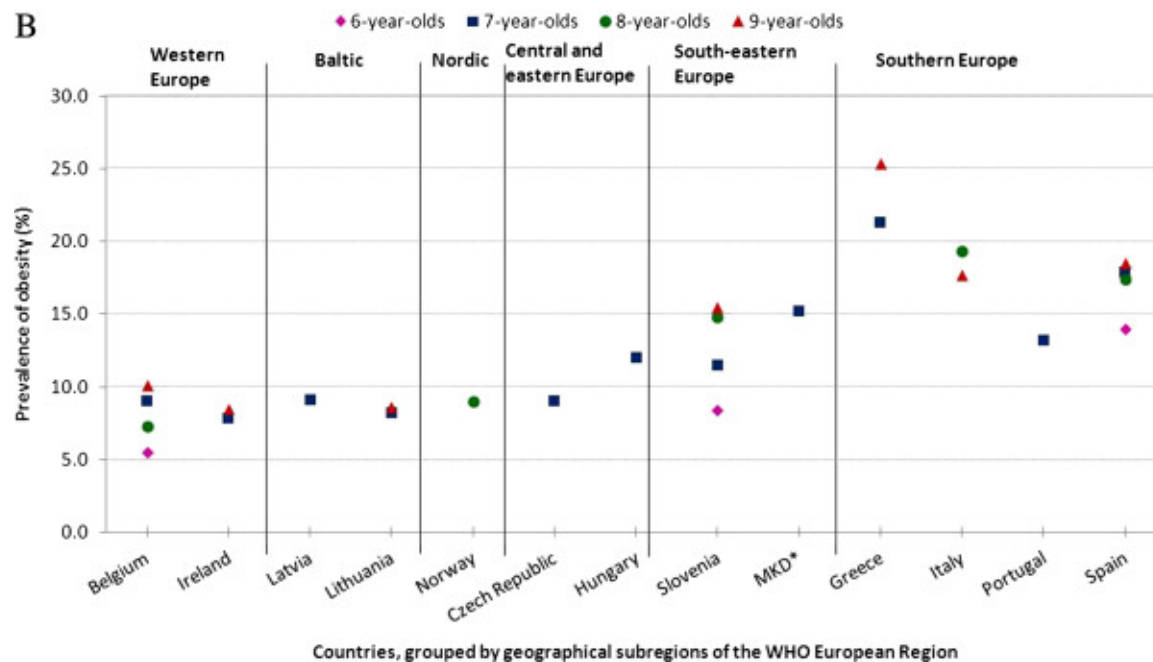
% Obesity	
	< 5 %
	5-9.9%
	10-14.9%
	15-19.9%
	20-24.9%
	≥ 25%



A

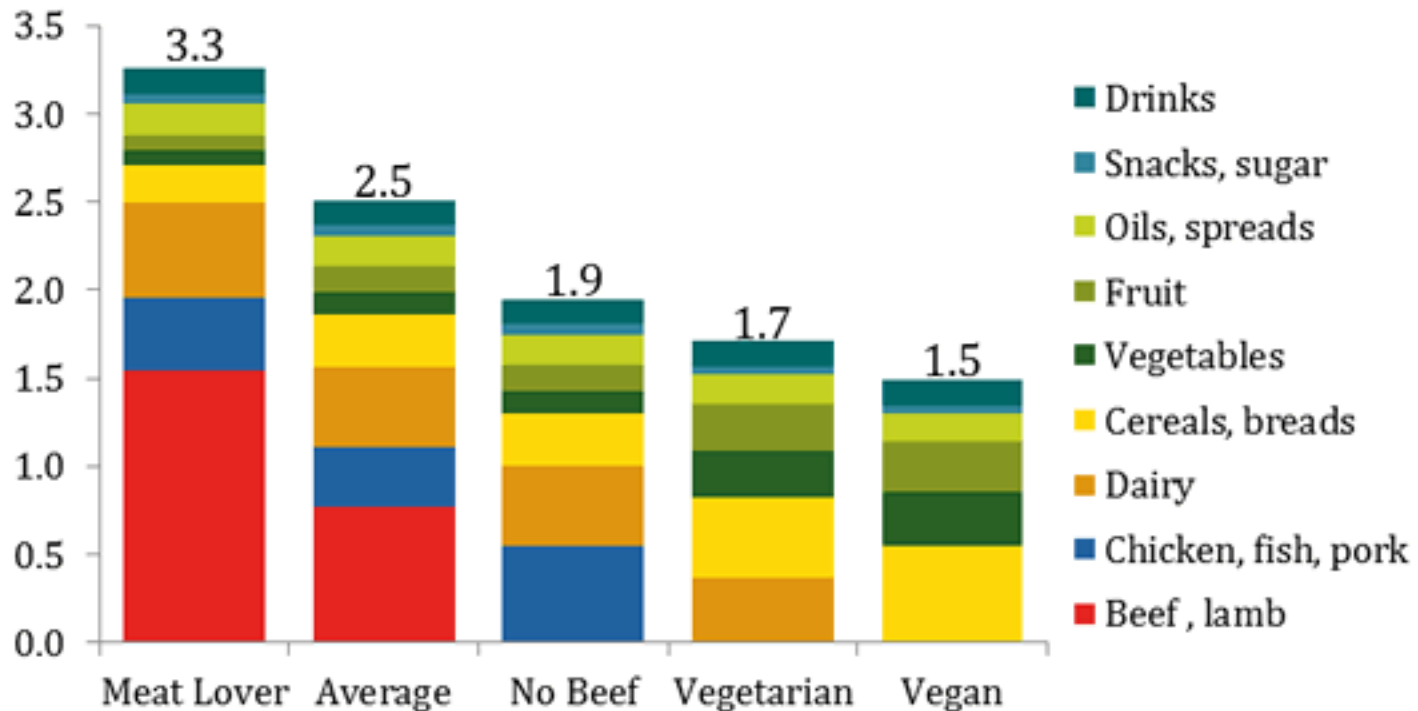


B



Climate Change

Foodprints by Diet Type: t CO₂e/person



Note: All estimates based on average food production emissions for the US. Foodprints include emissions from supply chain losses, consumer waste and consumption.. Each of the four example diets is based on 2,600 kcal of food consumed per day, which in the US equates to around 3,900 kcal of supplied food.

Sources: ERS/USDA, various LCA and EIO-LCA data



The role of new technologies

- Novel foods – including genetically modified foods and other food technologies
- Genetics – personalized nutrition
- Epigenetics and nutritional programming
- Information technology (IT)

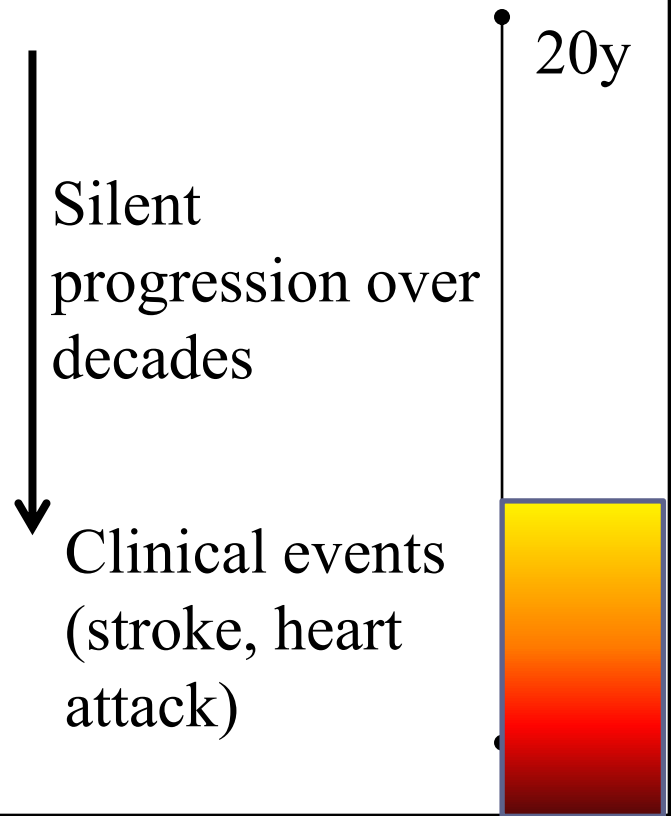
IT may be part of the solution but may also be part of the problem.

Diet related health risk among elders

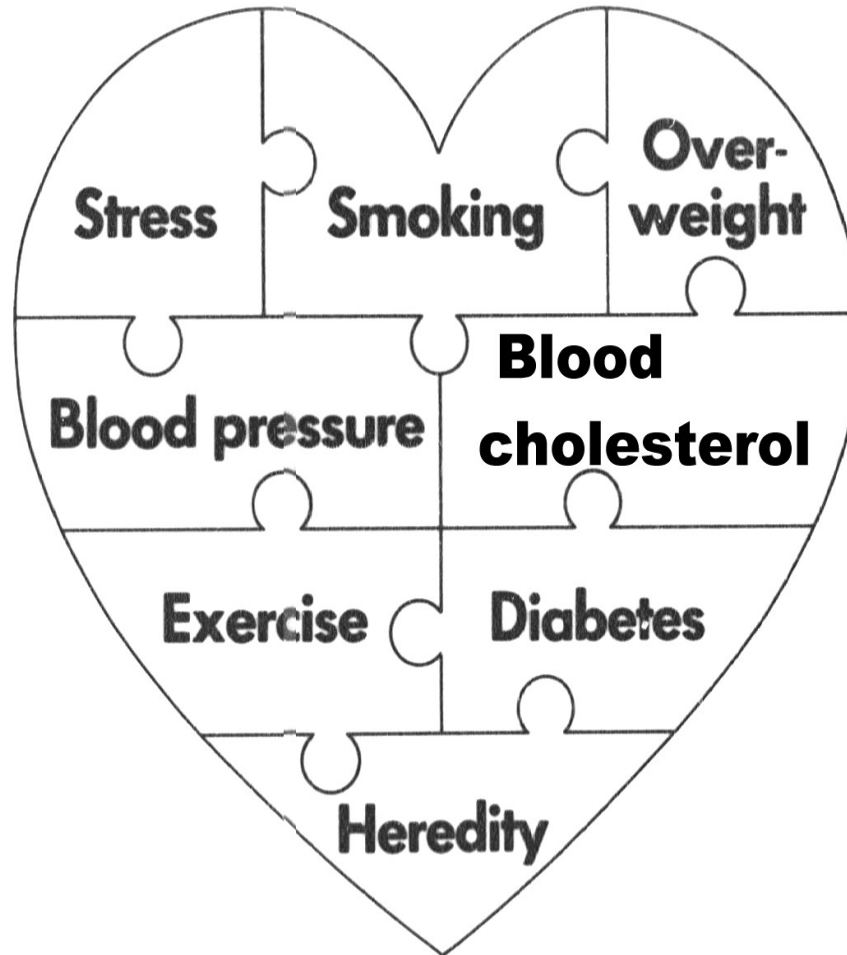
- Cardiovascular disease
- Cancer
- Diabetes
- Anaemia
- Bone health
- Sarcopenia
- Dementia and blindness

Pathology of atherosclerotic cardiovascular disease

1. Foam cell formation & arterial fatty streaks
2. Fibrous plaque formation
 - foam cell apoptosis,
 - smooth muscle proliferation
3. Plaque growth
4. Plaque rupture and thrombosis



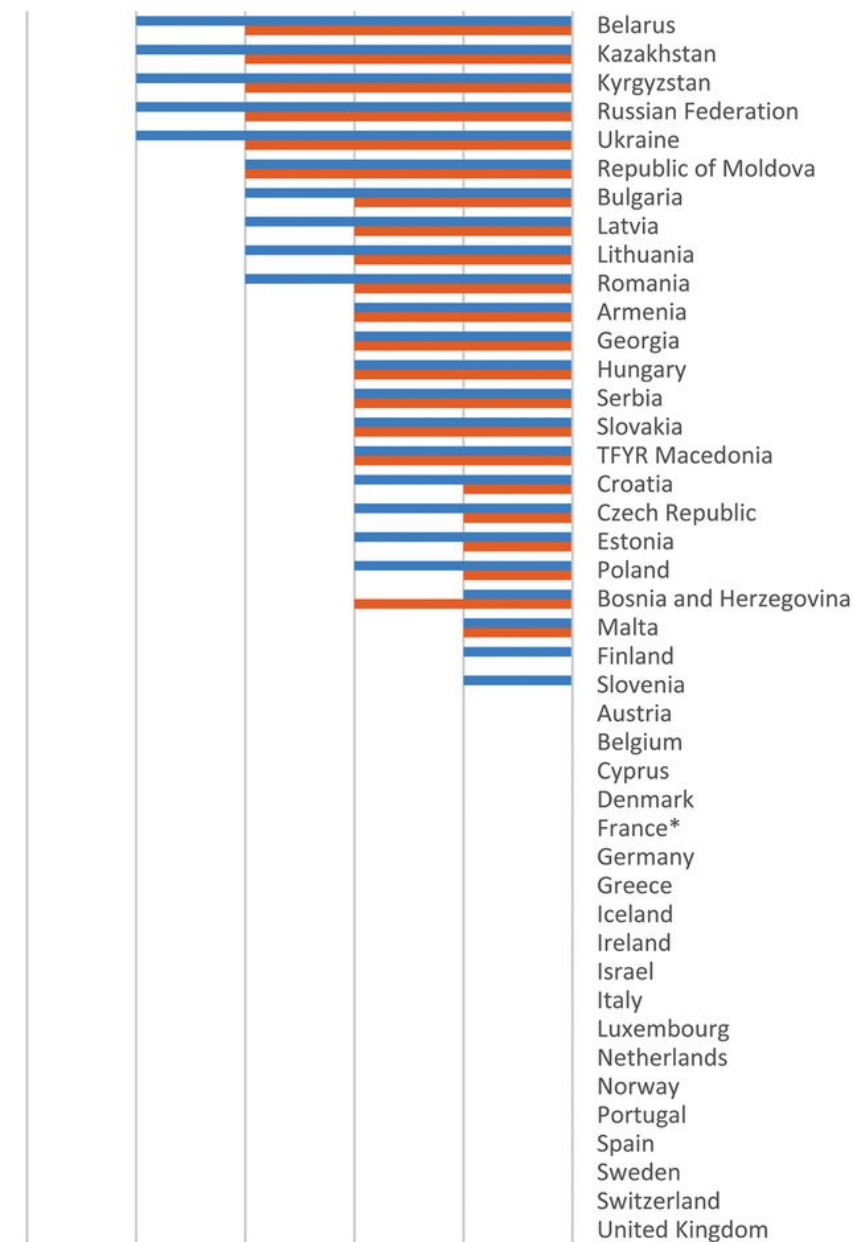
The Risk Factors



Cardiovascular disease

Age groups with rates exceeding France 75-79y

50 55 60 65 70 75

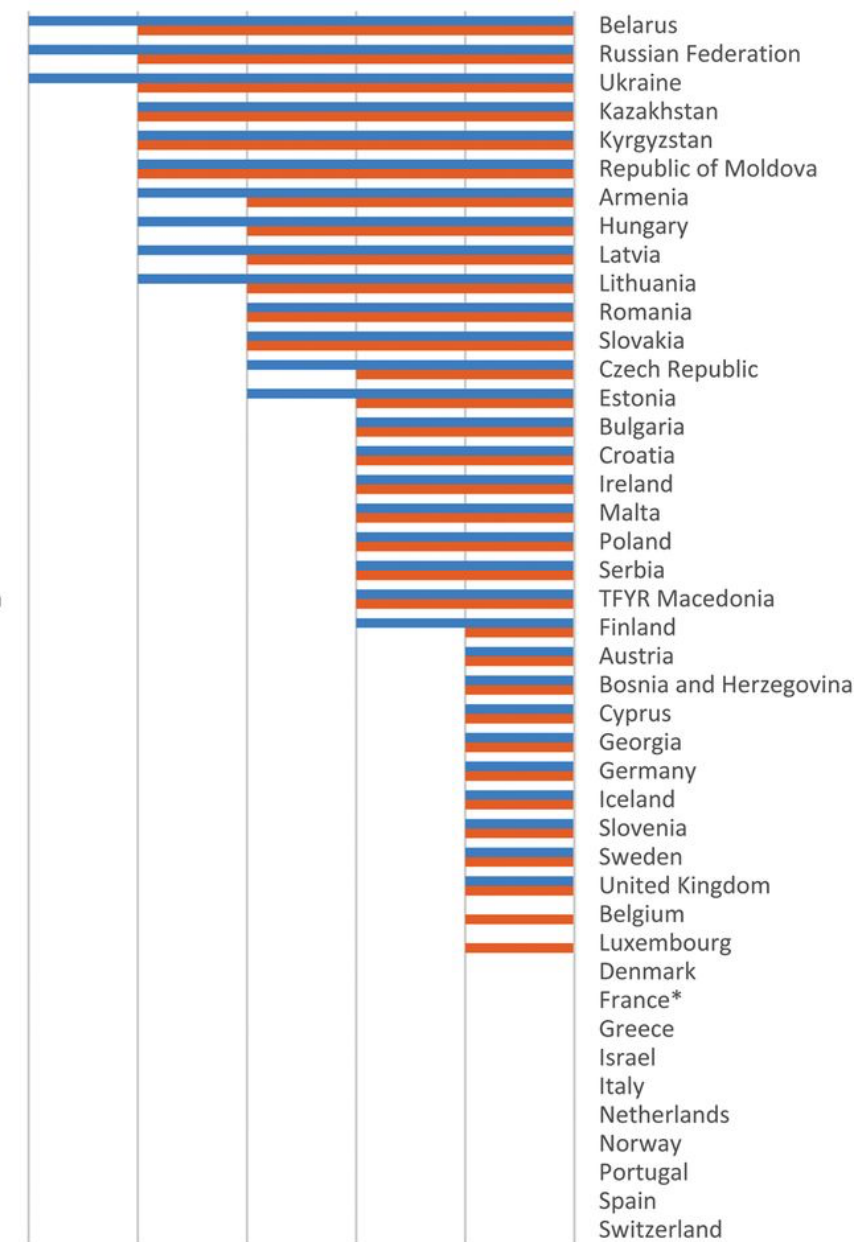


■ Males ■ Females

Coronary Heart Disease

Age groups with rates exceeding France 75-79y

50 55 60 65 70 75

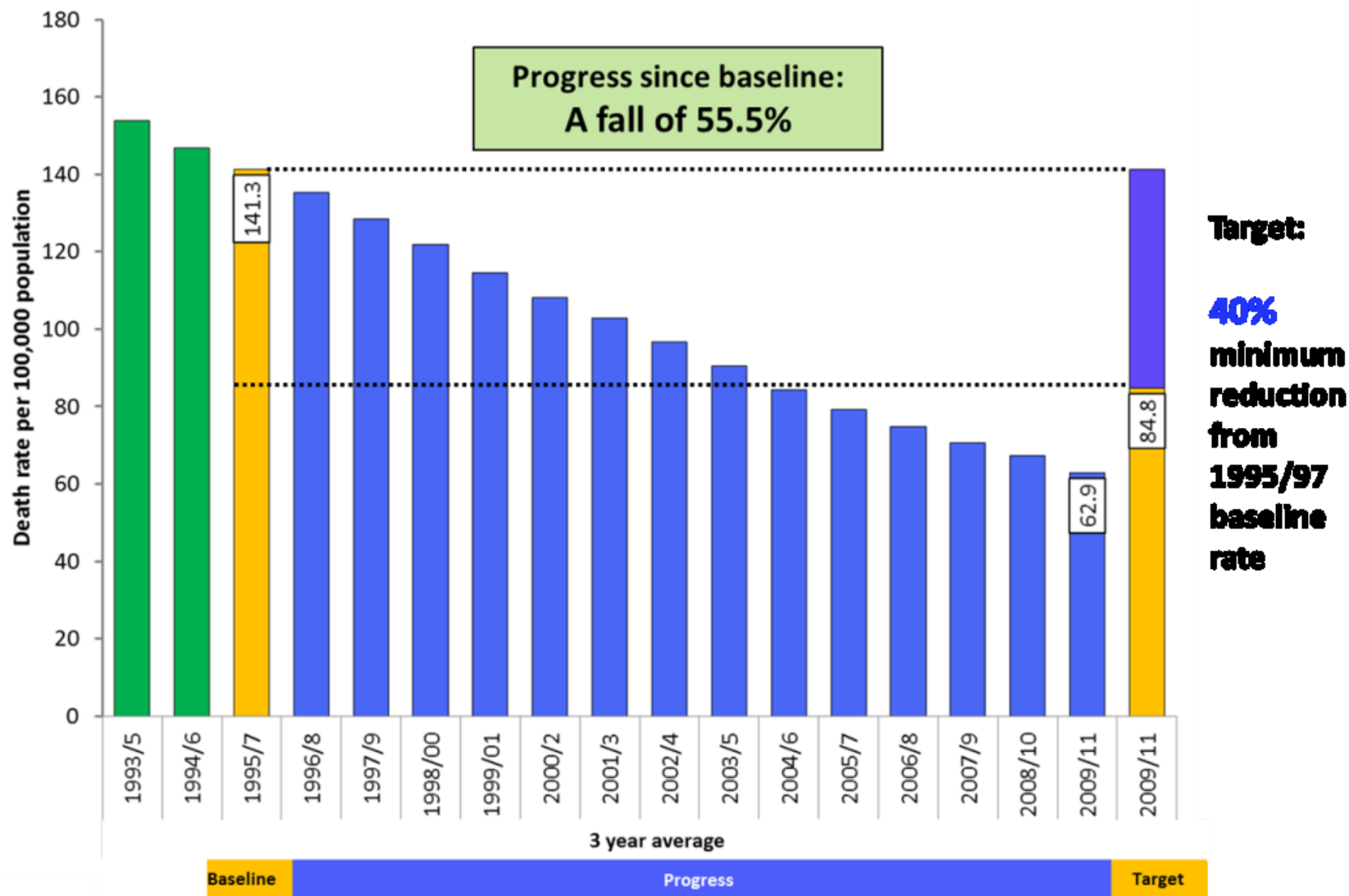


■ Males ■ Females

Circulatory Disease Mortality Target

Death rates from All Circulatory Disease In England 1993-2011 and target

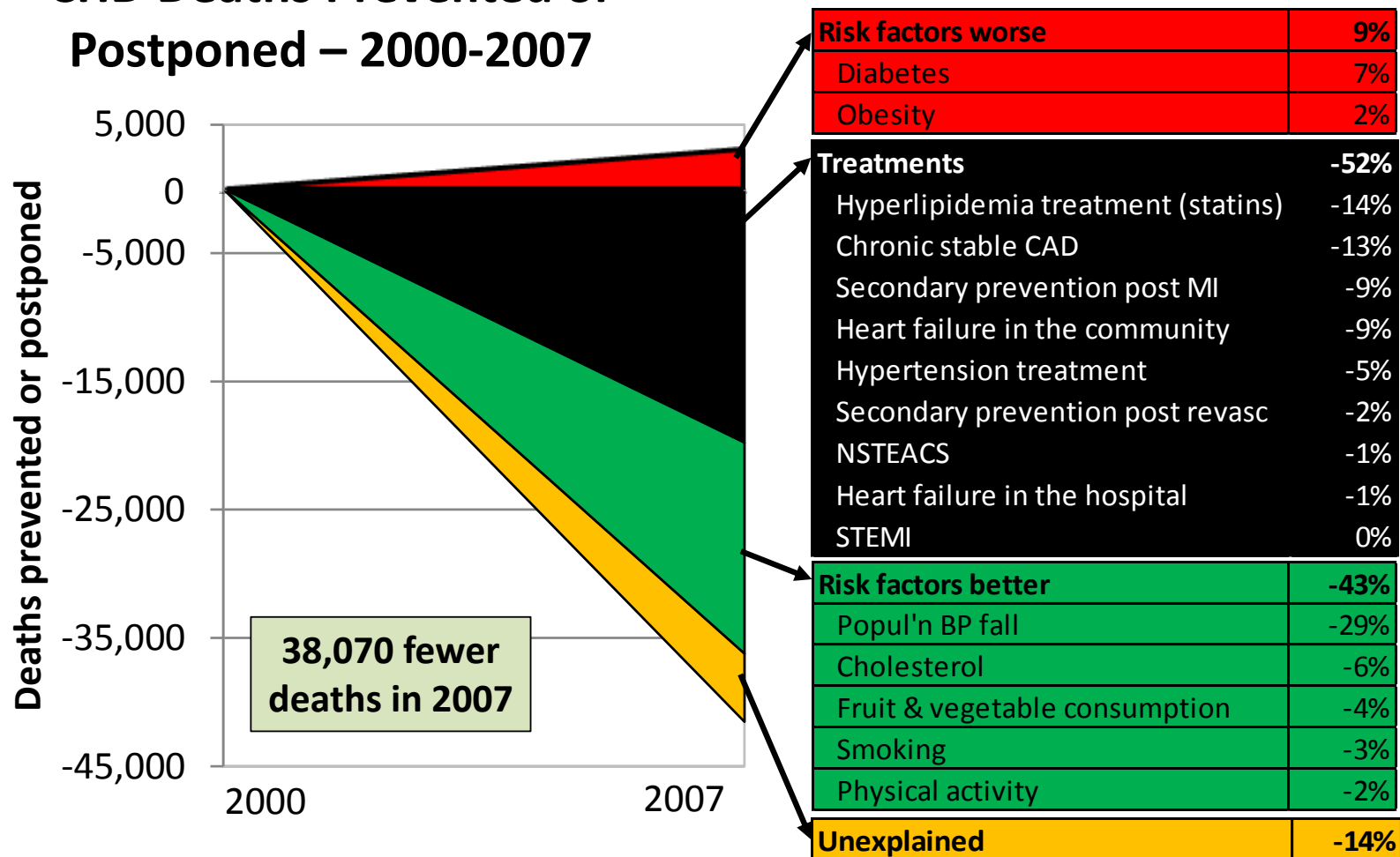
Persons under 75



Sources: NHS Information Centre. Compendium of Population Health Indicators (<https://indicators.ic.nhs.uk/webview/>). Original data National Statistics. Circulatory Disease – ICD9 390-459 adjusted, ICD10 I00-I99.

Ground Gained.....

CHD Deaths Prevented or Postponed – 2000-2007

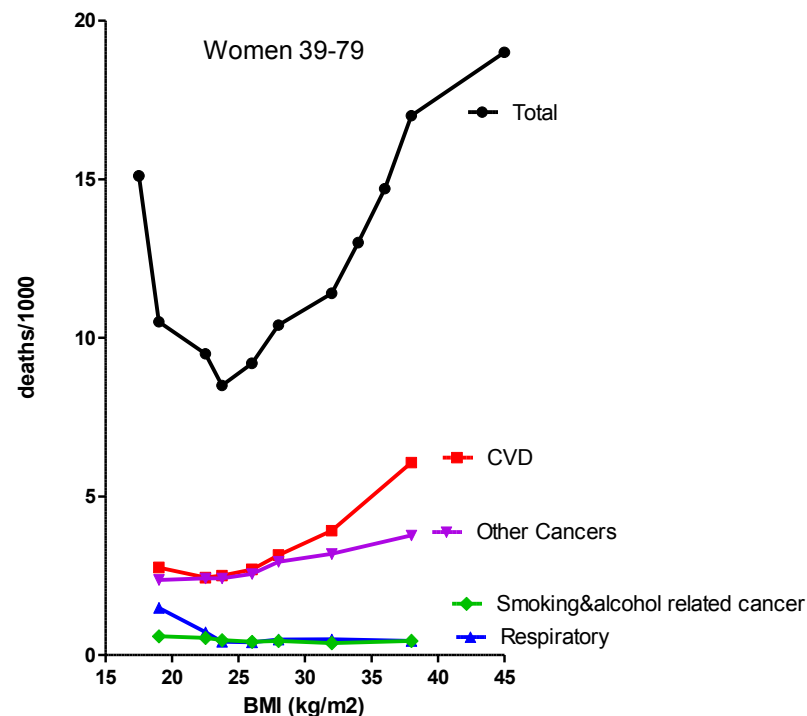
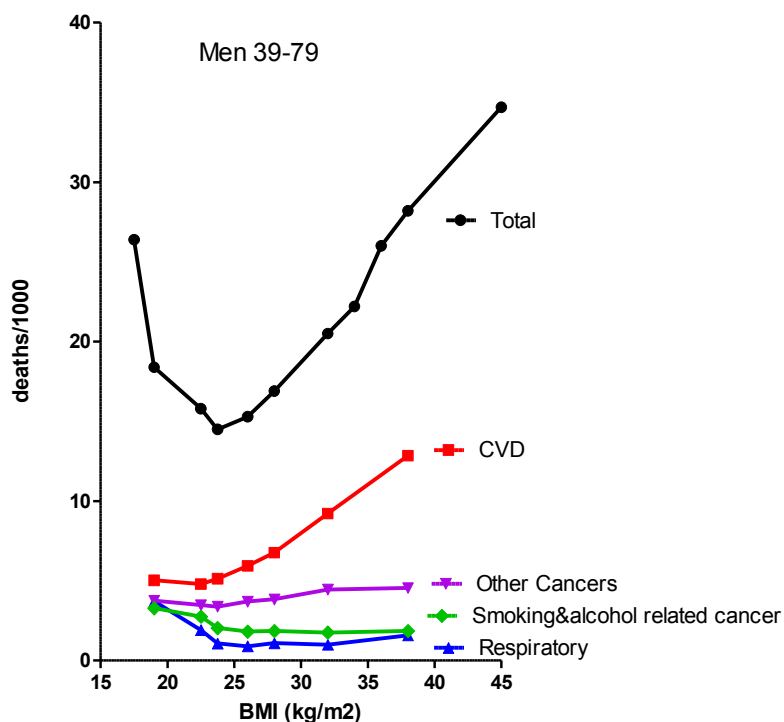


Junk Food Man and the obesogenic environment

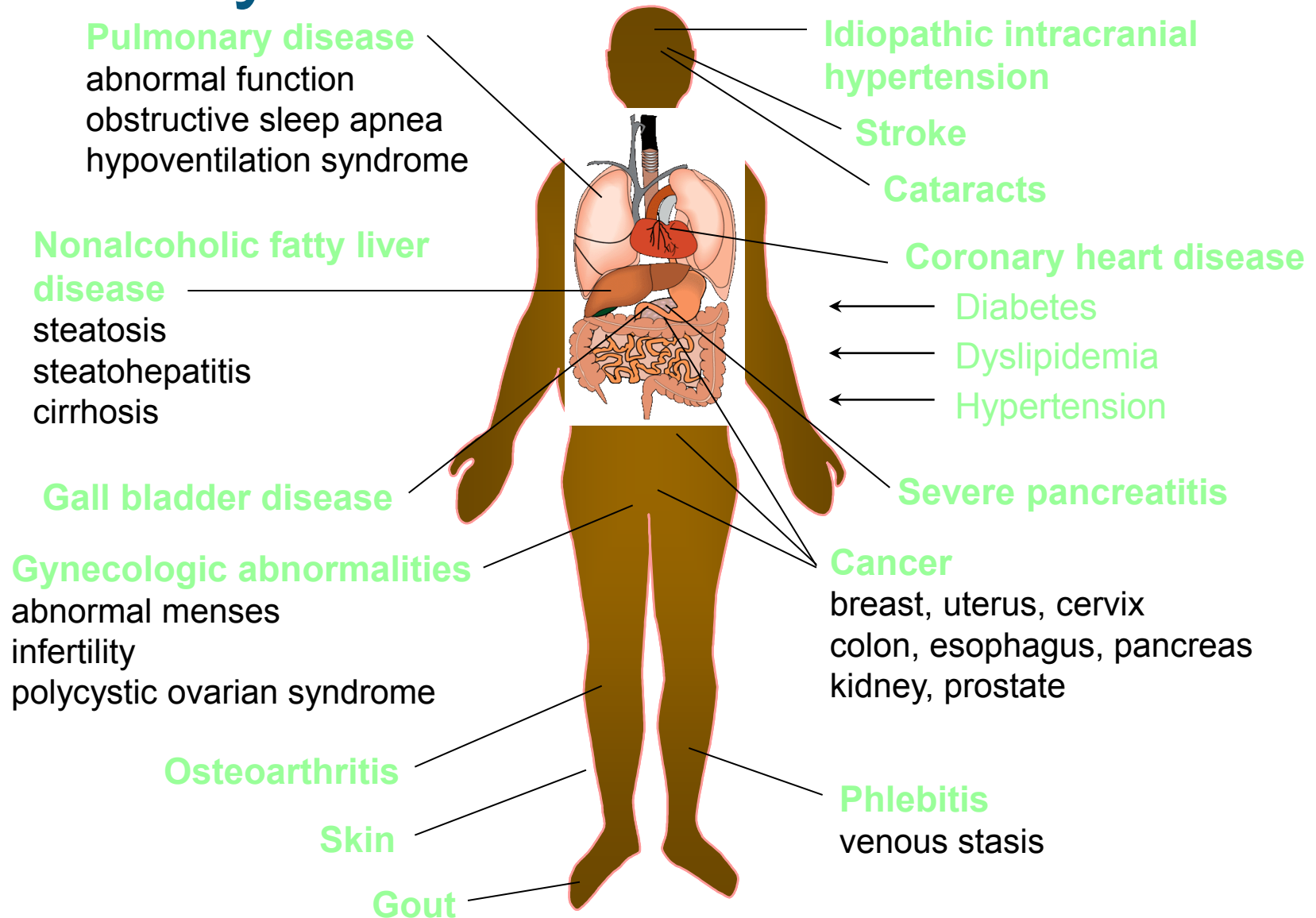


Mortality rates from different causes by body mass index (BMI) in non-smokers

Note the differences in scale and women are fatter than men



Co-morbidities associated with obesity



England

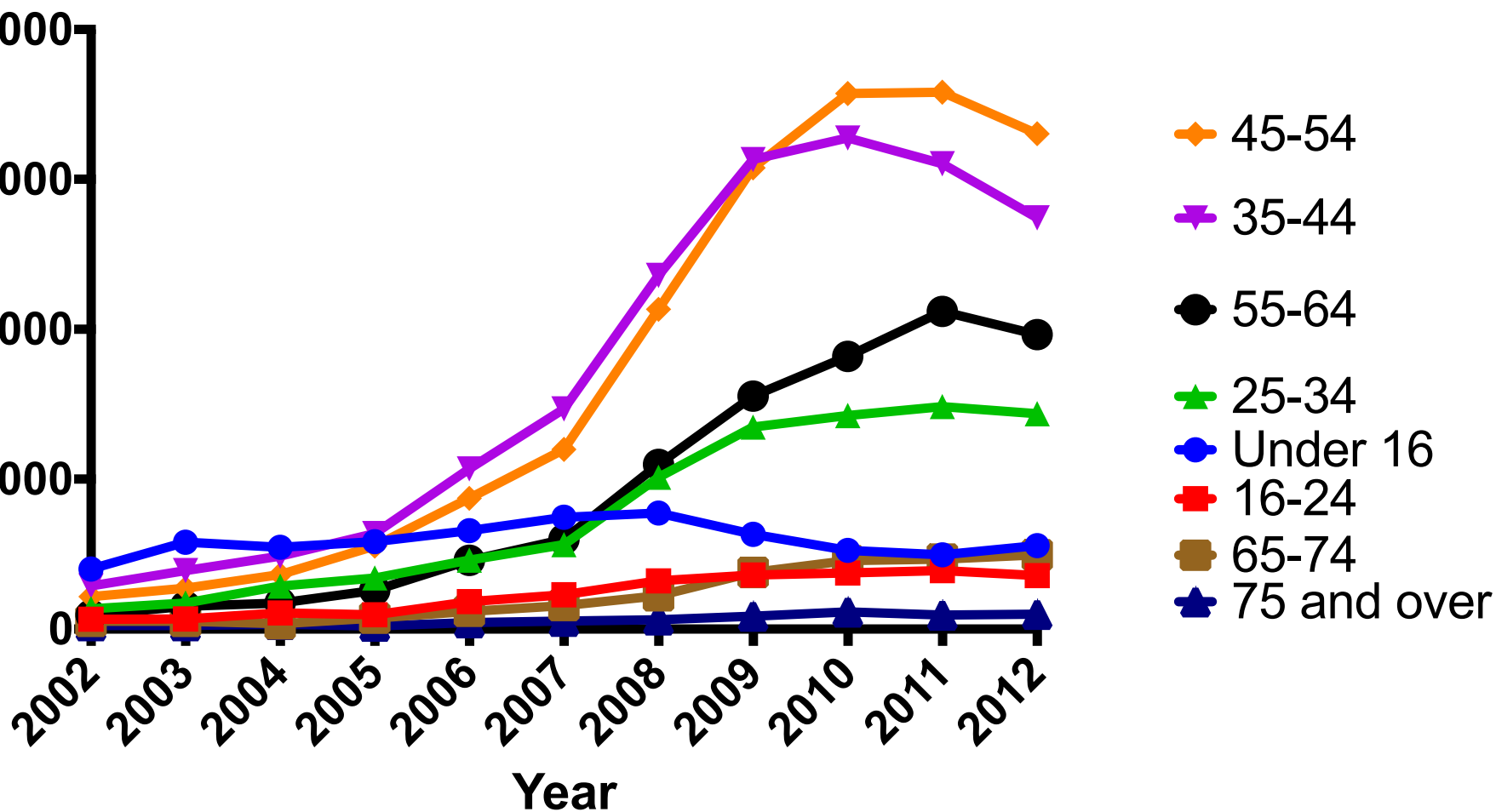
Primary admission for obesity

4000
3000
2000
1000
0

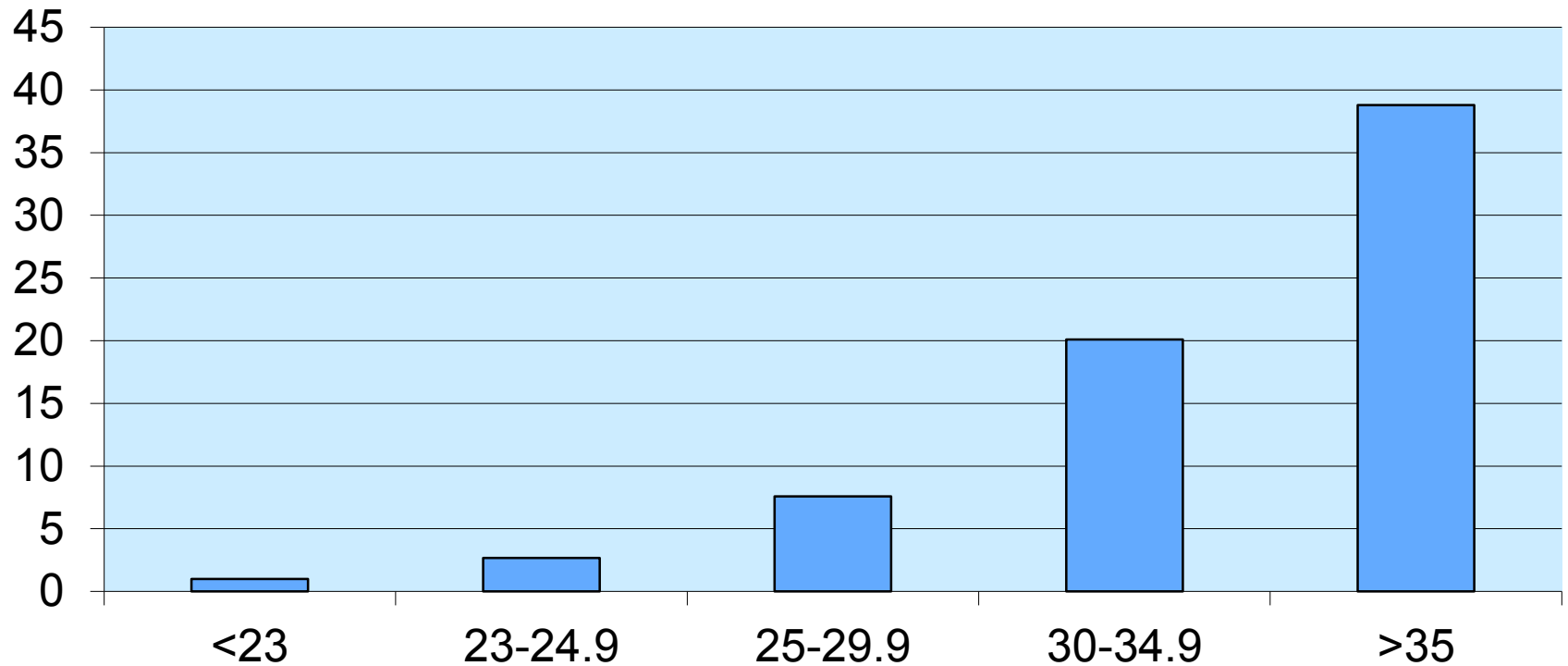
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012

Year

- 45-54
- 35-44
- 55-64
- 25-34
- Under 16
- 16-24
- 65-74
- 75 and over

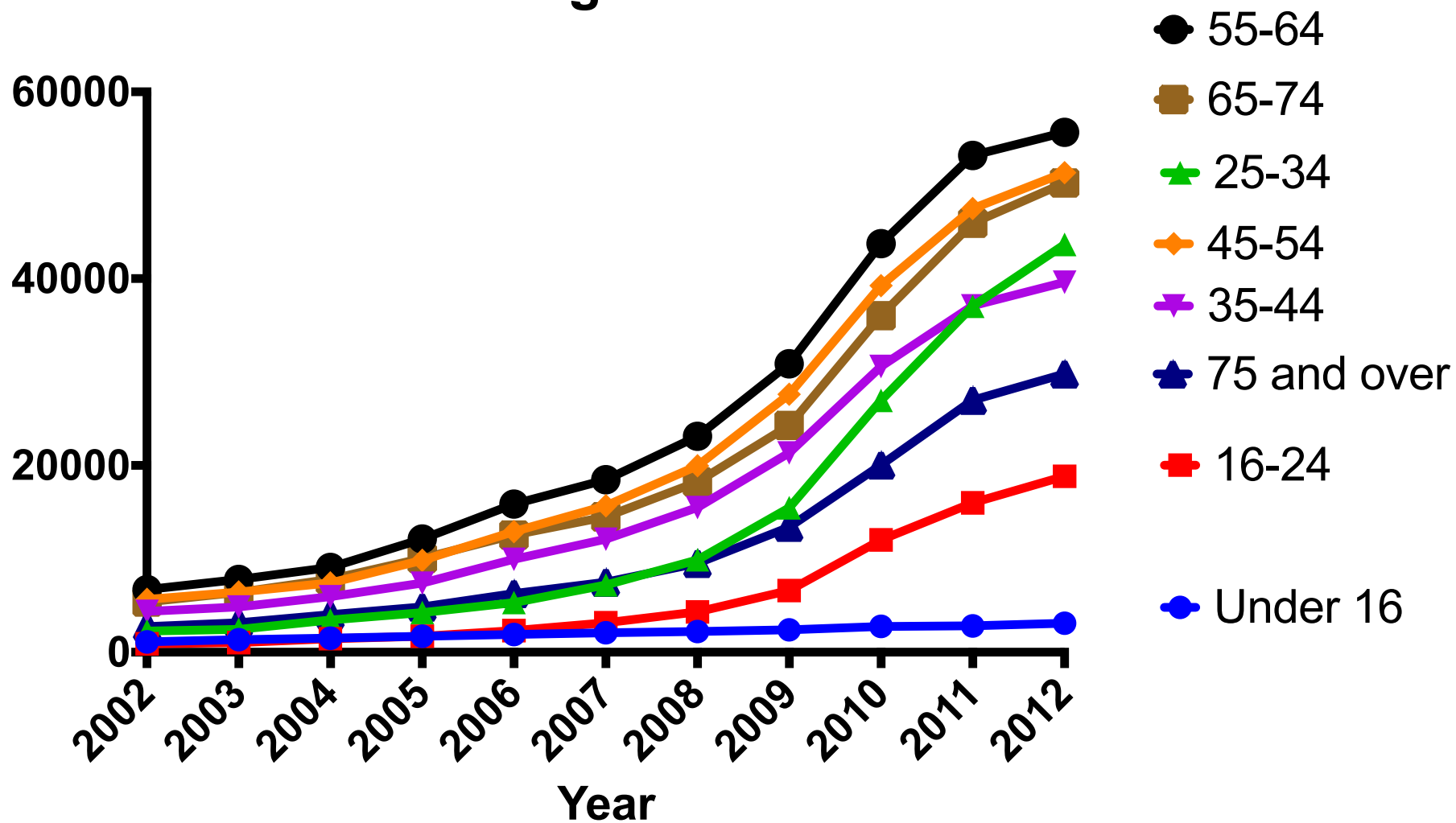


Relative risk of developing type 2 diabetes increases with increasing body mass index



Primary and secondary admission for obesity

England



Increased availability of foods high in fat and sugar



1600
kcal/pot

selected mini bites

a range of indulgent treats with no added
preservatives, artificial colours or flavourings

buy 2 for

£4



STARTS SA
13 SEPT
THE INDEPENDENT





SLOW FOOD

high skills base, time
consuming, set meal times

FAST FOOD

large portion sizes,
energy dense food,
no meal planning

SCRATCH COOKING

primary
products,
traditional
grocery

COMPONENT COOKING

ready prepared
vegetables,
prepared
meat/fish,
sauces, pizza

READY MEALS

TAKE-AWAYS



SNACKING 'ON THE HOOF'

sandwiches,
danish pastries,
confectionery

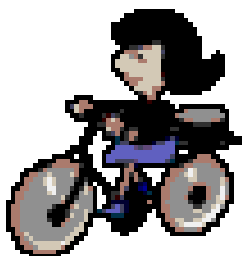
DELIVERY



QUICK SERVE



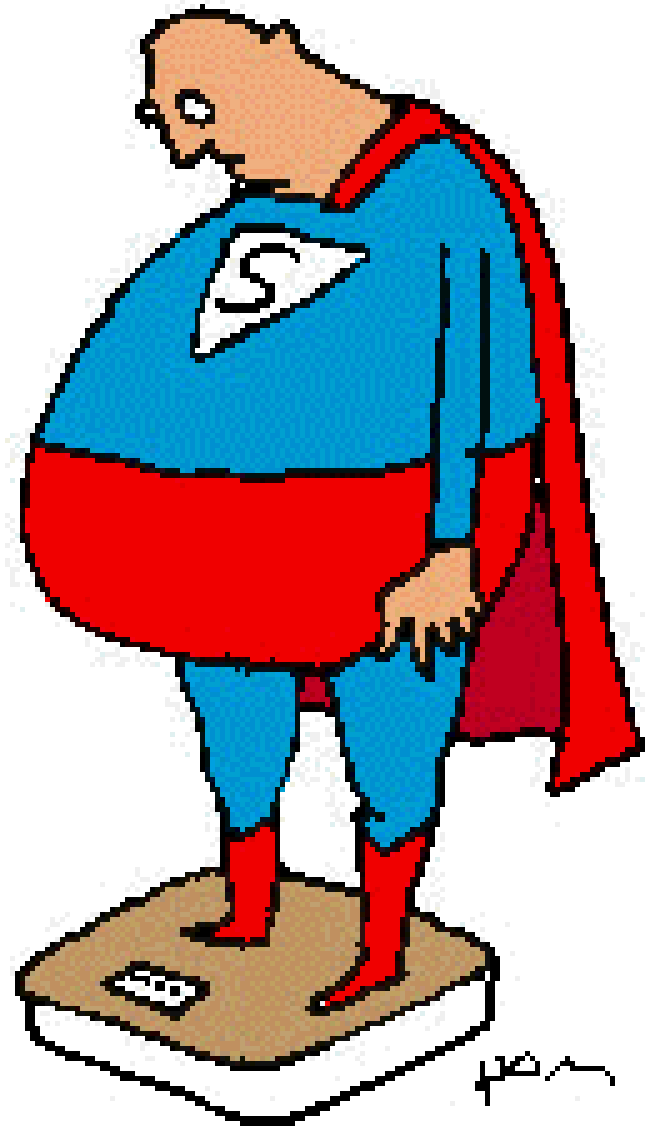
Physical activity



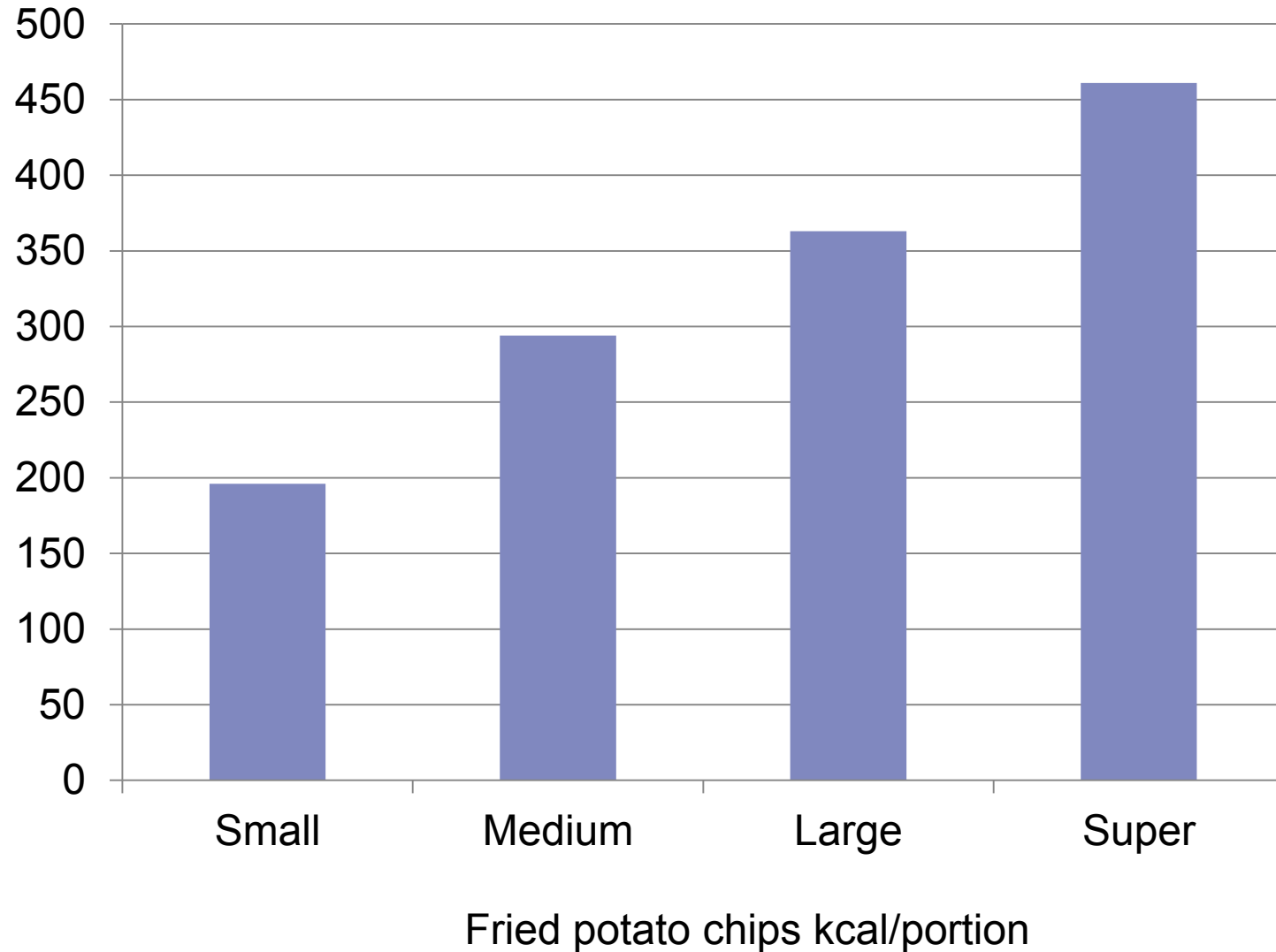
Physical inactivity



- Self delusion
- Under-reporting of food intake
- Exaggerated reports of levels physical activity



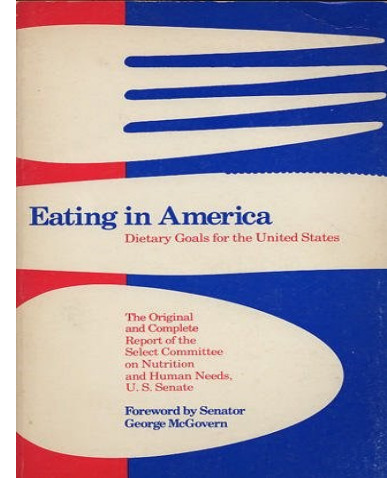
Portion size is important



Reducing the intake of “empty calories” improves the overall nutritional profile: targets include

- Sugar sweetened beverages
- Confectionery
- Alcoholic beverages
- Added fat

The McGovern Report 1977



The first Goal focused on energy balance and recommended that, to avoid overweight, Americans should consume only as much energy as they expended. Overweight Americans should consume less energy and expend more energy.

The second Goal changed the dietary pattern

- Increase consumption of complex carbohydrates and "naturally occurring sugars;
- Reduce consumption of refined and processed sugars, total fat, saturated fat, cholesterol, and sodium.

Targets of **30%** and **10%** were set for total and saturated fat

Food based goals of the 1977 McGovern Report

- “Increase consumption of fruits, vegetables, and whole grains;
- Decrease consumption of refined and processed sugars and foods high in such sugars; foods high in total fat and animal fat, and partially replace saturated fats with polyunsaturated fats; eggs, butterfat, and other high-cholesterol foods; salt and foods high in salt; and
- Choose low-fat and non-fat dairy products instead of high-fat dairy products (except for young children).”

The *Dietary Guidelines for Americans, 2015* continues to emphasize three major goals for Americans:

1. Balance calories with physical activity to manage weight.
2. Consume more of certain foods and nutrients such as fruits, vegetables, whole grains, fat-free and low-fat dairy products, and seafood.
3. Consume fewer foods with sodium (salt), saturated fats, *trans* fats, added sugars, and refined grains.

Evidence from randomised controlled trials did not support the introduction of dietary fat guidelines in 1977 and 1983: a systematic review and meta-analysis

Zoë Harcombe,¹ Julien S Baker,¹ Stephen Mark Cooper,² Bruce Davies,³
Nicholas Sculthorpe,¹ James J DiNicolantonio,⁴ Fergal Grace¹

Open Heart 2015;**2**:e000196.
doi:10.1136/openhrt-2014-
000196

FROM THE HEART
Saturated fat is not the major issue
Let's bust the myth of its role in heart disease

Aseem Malhotra interventional cardiology specialist registrar, Croydon University Hospital, London

Indeed, recent prospective cohort studies have not supported any significant association between saturated fat intake and cardiovascular risk.



Scientists universally accept that saturated fats in foods, bakery products, and cardiovascular disease through "saturated fat" is another must be removed to reduce has dominated dietary advice for decades.

The Washington Post Politics Opinions Local

Health & Science

Experts disagree on which fats should be consumed and in what exact proportions

By Consumers Union of United States, April 29, 2013

If you're confused about fats these days, you're in good company. With so much published in recent years, even experts have a hard time agreeing on what to consume, and in what exact proportions, to improve our health. Here's what the strongest evidence says about healthful choices.

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Start spreading the news - saturated fat 'is not so bad,' says study

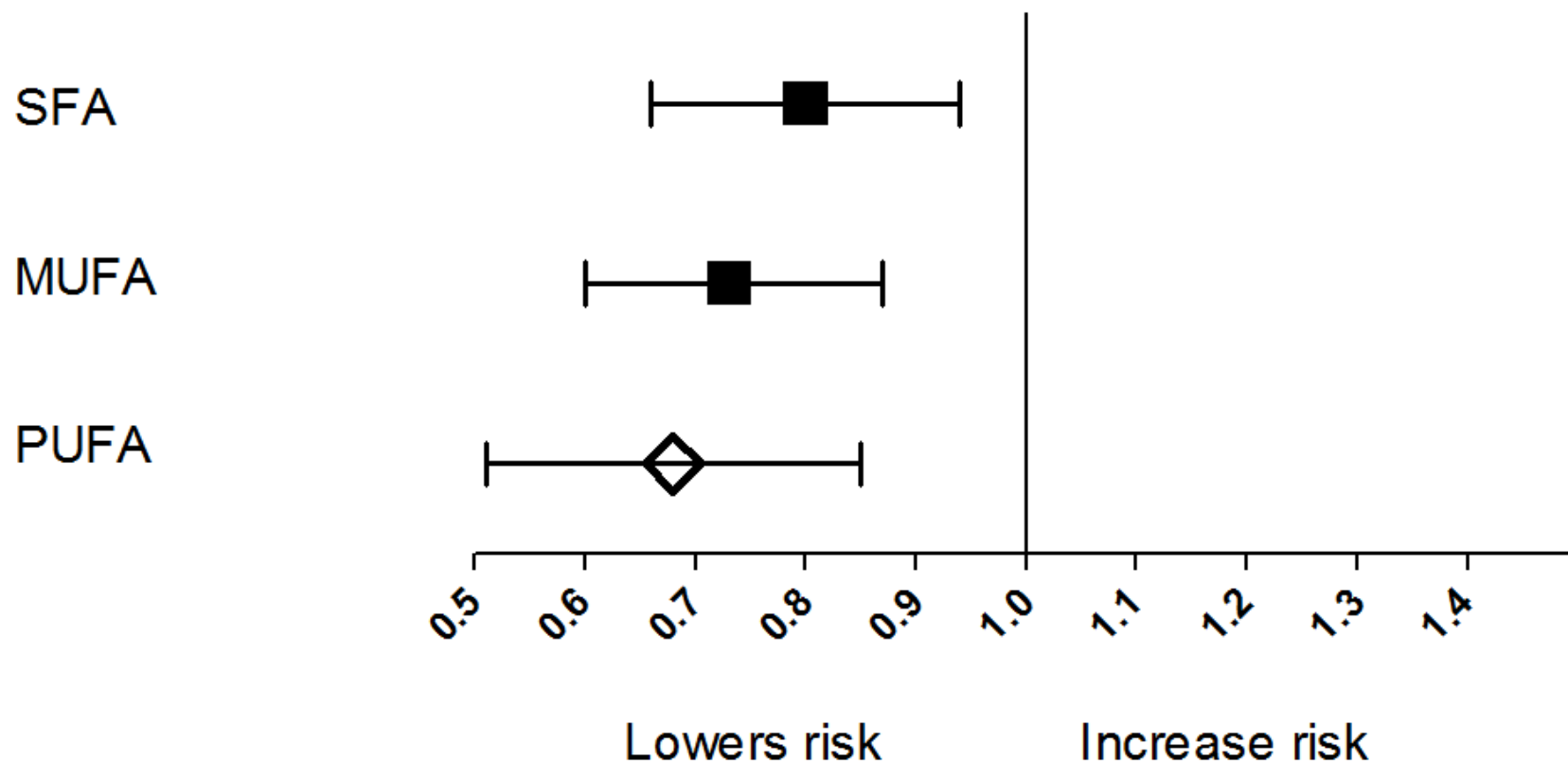
US research suggests that margarine might have been more harmful than butter and lard all along

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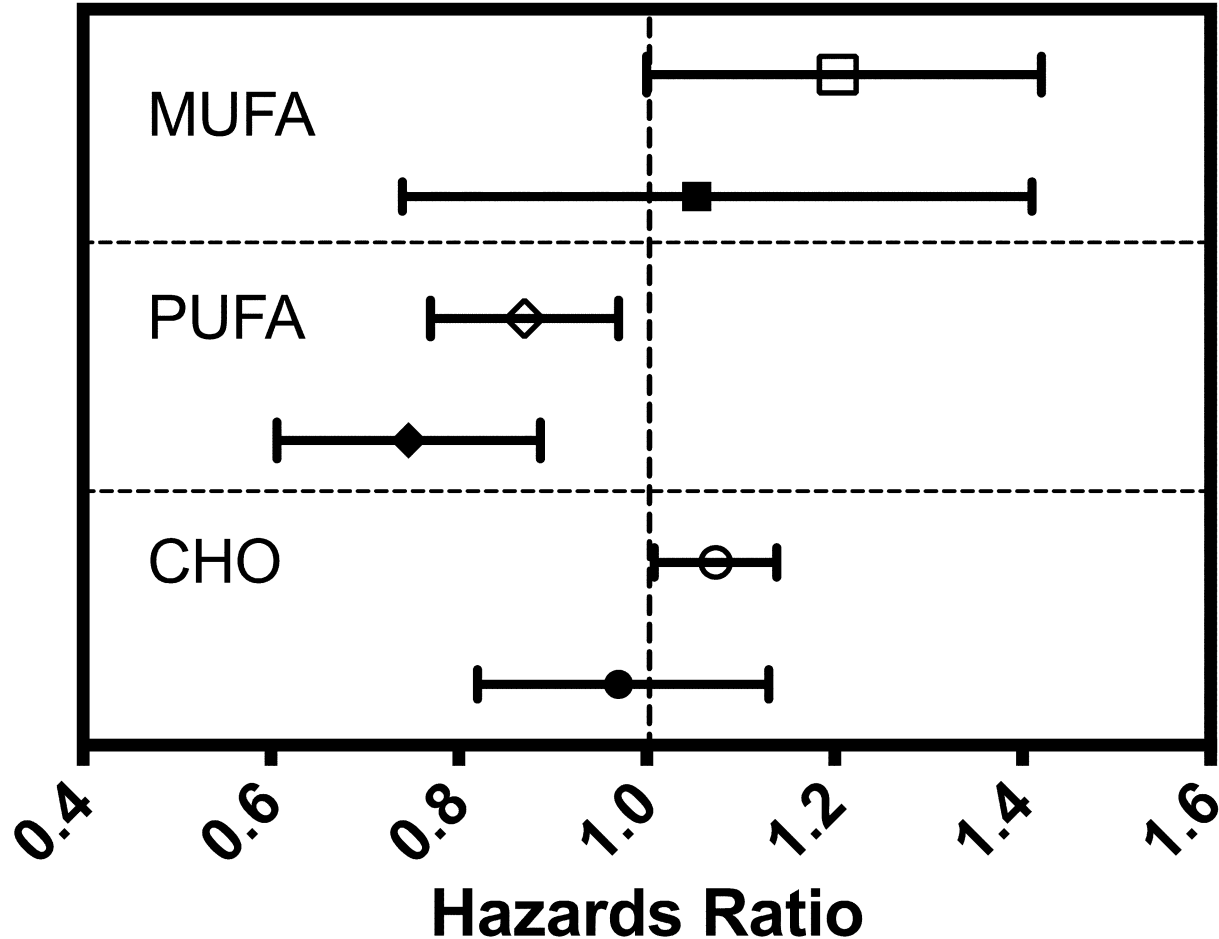




CHD risk reduction estimates of replacing 2% trans fatty acids with saturated, monounsaturated or polyunsaturated fatty acids



CHD risk estimates of replacing 5% energy saturated fatty acids with monounsaturated (MUFA), polyunsaturated (PUFA) or carbohydrates (CHO) from pooled analysis of 11 cohort studies



Open and closed symbols denote incidence and mortality

Farvid et al. Meta-analysis based on 310,602 people and 12,479 CHD events

“Our meta-analysis suggests that intake of LA (linoleic acid), the predominant n-6 PUFA, has cardio-protective effects

- a 5% increase in energy from LA, replacing SFAs, was associated with 9% lower risk of total CHD and 13% lower risk of CHD deaths.”

Omega-3

- There is no clear evidence of benefit from trials of long-chain omega-3 PUFA supplements in people with pre-existing cardiovascular disease. However, further trials are on-going!
- There is consistent evidence that eating fish, especially oily fish, at least once a week is associated with a lower risk CHD and stroke. There is some evidence from cohort studies to suggest linolenic acid reduces risk of sudden death.
- The mechanism for the protective effect of low fish intakes requires further elucidation.

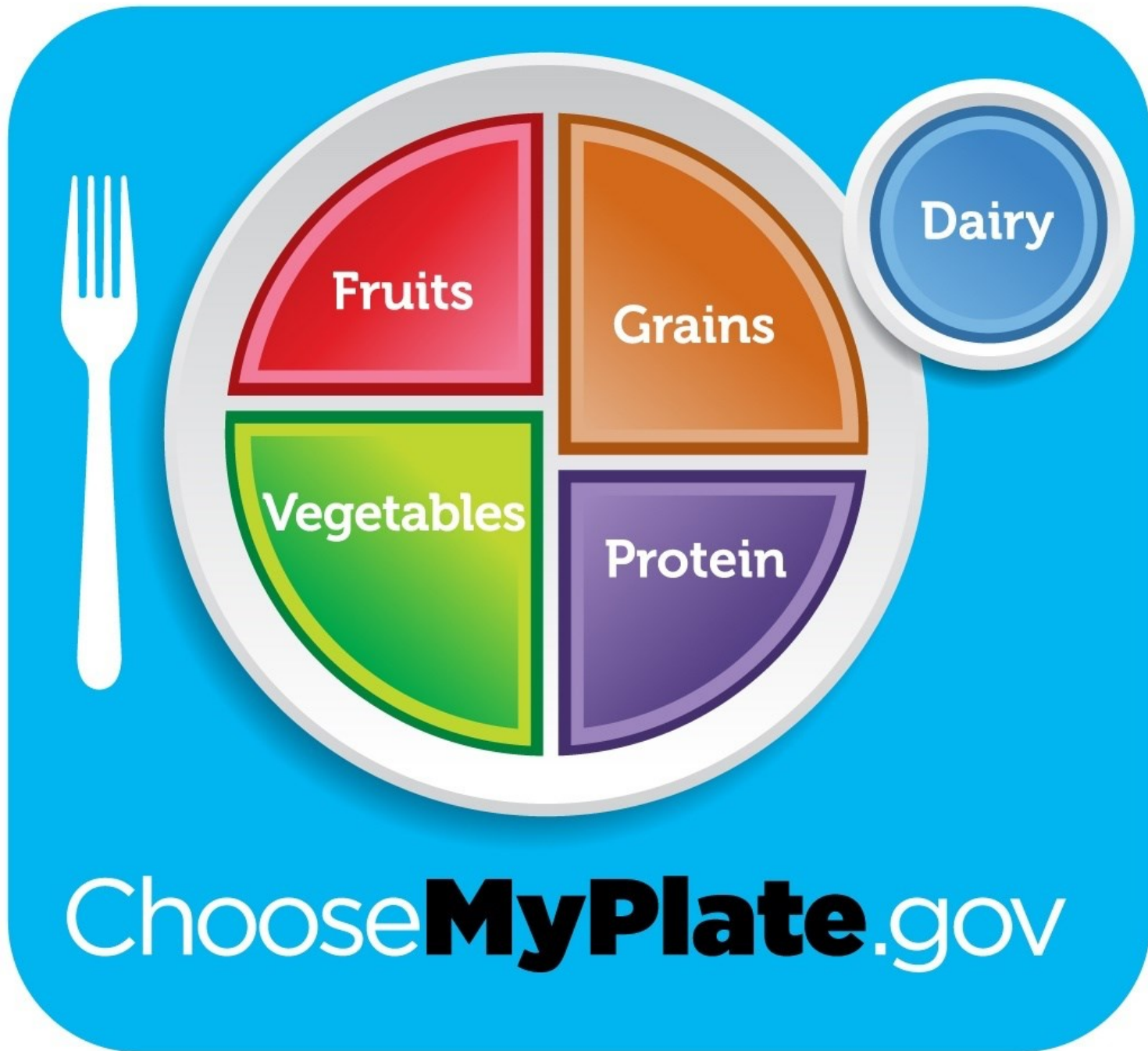
Current advice focuses on favourable dietary patterns

Mediterranean (strong evidence)

Japanese

Vegetarian

Less red and processed meat (rich sources of saturated fat)





FACTS ABOUT

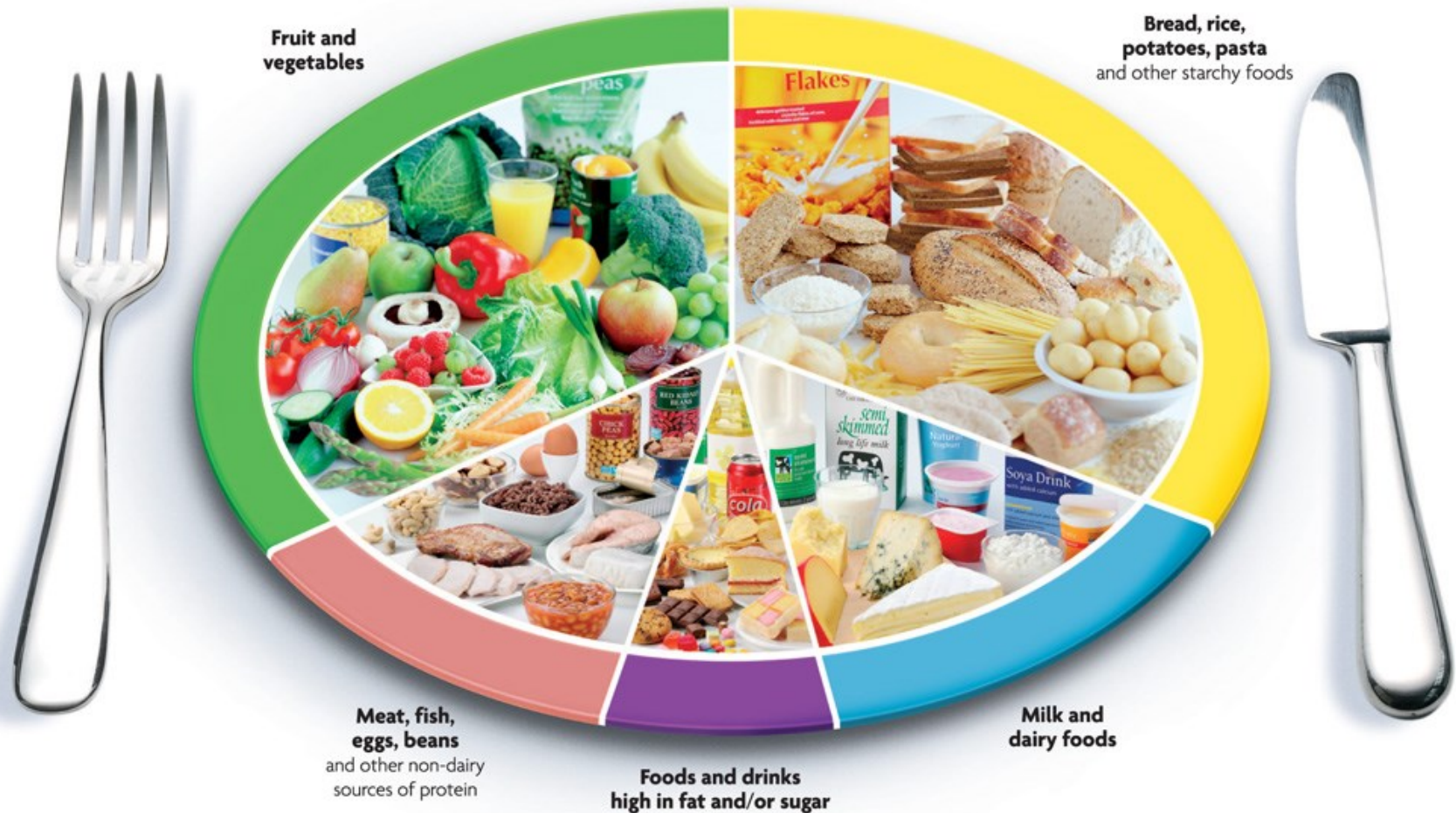
The *DASH* Eating Plan



- Emphasises fruit, vegetables and low-fat dairy foods
- Includes wholegrains, poultry, fish and nuts
- Contains less red meat, sweets and sugar containing beverages

The eatwell plate

Use the eatwell plate to help you get the balance right. It shows how much of what you eat should come from each food group.



The solutions may be simple and not hi-tech

- A shift in the overall diet towards one that is more plant based is likely to be of benefit to health and climate change.
- Industry has an important role in re-formulating processed food to eliminate trans fats and reduce added sugar and salt.
- Changes are needed in the way food is marketed, particularly to children and younger adults, in order to reduce overconsumption.
- Consideration needs to be given on how to keep elders well at home and out of care.
- Increased physical activity is beneficial at all ages.